Thomas Bury

Curriculum Vitae

Department of Applied Mathematics
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Education

2015-2019 **PhD, Applied Mathematics**, *The University of Waterloo*.
Thesis title : On the nature and prediction of tipping points in complex systems.
GPA : 96.4%
Advisors : Prof Chris Bauch, Prof Madhur Anand

2011–2015 **BA, MMATH, Mathematics**, *Queens' College, The University of Cambridge*.
Awarded first class honours. Courses included theoretical and biological physics.

Research Positions

2017-current **Senate Graduate and Research Council**, *The University of Waterloo*.
Math grad student representative for matters of academic quality and research activity within the university

2015-current **Doctoral Candidate**, *The University of Waterloo*.
Fully funded 4-year programme to conduct complex systems research in the Department of Applied Mathematics.

2014 Jun-Aug **DAMTP Summer Research Student**, *The University of Cambridge*.
Fully funded summer research post to analyse the spatio-temporal dynamics of the 2009 UK Influenza outbreak.
- Advisor : Dr Julia Gog
- Collaborators : Dr Hongyi Zhang and Dr Suzanne English, Addenbrooke's Hospital.

Invited Talks

August 2018 ESA Annual Meeting 2018, *'Early warning indicators of ecological tipping points: do they predict critical transitions in multi-stable systems, or something else?'*.

Contributed Talks

May 2018 WICI Workshop, Leveraging systems approaches to improve human & planetary health, *'A Hands-On Introduction to Mathematical Modelling'*.

Jan 2018 Centre for Teaching Excellence, University of Waterloo, *'Breaking the Norm: Cooperative Learning in the Undergraduate Math Classroom'*.

Jan 2018 Dynamics Days U.S., *'Characterising impending transitions in complex systems'*.

Nov 2017 GRADTalks, University of Waterloo, *'Tipping Points and the Role of Mathematics'*.

Sept 2017 TEDx, University of Toronto, *'Tipping Points and the Role of Mathematics'*.

Aug 2017 AMMCS International Conference, *'Anticipating critical transitions in socio-ecological systems'*.

Jul 2017 Mathematical Models in Ecology and Evolution Conference, City University of London, *'Regime shifts in socio-ecological systems : silent early warning signals in the natural subsystem'*.

May 2017 WICI, Resilience in Complex Natural and Human Systems, University of Waterloo, *'Early warning signals in socio-ecological systems'*.

Mar 2016 Applied Mathematics Graduate Colloquium, University of Waterloo, *'Modelling infectious disease: can we anticipate critical transitions?'*.

Journal Publications

P1 T. M. Bury, C. T. Bauch, and M. Anand. Charting pathways to climate change mitigation in coupled socio-climate models. *Nature Communications (in review)*, 2018.

P2 A. D. Pananos, T. M. Bury, C. Wang, J. Schonfeld, S. P. Mohanty, B. Nyhan, M. Salathé, and C. T. Bauch. Critical dynamics in population vaccinating behavior. *Proceedings of the National Academy of Sciences*, page 201704093, 2017.

Awards and Grants

Jan 2018 Travel grant for ESA annual meeting. ($1000) *WICI*

Jan 2018 Travel grant for conference 'Dynamics Days U.S.' ($1000) *WICI*

Nov 2017 GradTalks research dissemination award ($500). *University of Waterloo*

Apr 2017 Public speaking award ($300). *Fields Thesis Competition*

Feb 2017 Faculty level winner. *Three-Minute-Thesis competition*

Jul 2016 Foundation Scholarship. *Queens' College, University of Cambridge*

Teaching

Certifications

2016-current **Certificate of University Teaching**, *University of Waterloo*.
A two-year, in depth, selective teaching course for PhD students interested in pursuing an academic career. In progress.

2015-2016 **Fundamentals of University Teaching**, *University of Waterloo*.
University teaching course with emphasis on active learning. Consists of weekly workshops and three teaching assessments. Teaching reviews available.

Select teaching appointments

Fall 2018 **Course Instructor**, *University of Waterloo*.
- Course : Calculus I for the Sciences, 115 students, 1 teaching assistant
- Contribution: Designed and implemented lectures three times a week, aided construction of exams and projects, managed teaching assistant and tutorial sessions.

Fall 2016 **Lead Teaching Assistant**, *University of Waterloo*.
- Course : Calculus I for Engineers, 667 students, 11 teaching assistants
- Contribution: designed weekly problem sheets with solutions for the course, ran interactive tutorial sessions, held office hours, marked and proctored exams

Winter 2018 **Teaching Assistant**, *University of Waterloo*.
- Course : Stochastic processes in the physical sciences, 15-20 graduate students, 1 teaching assistant
- Contribution: gave guest lectures on specialist topics, provided sample code with live demonstrations, extended course notes, marked assignments

Volunteering

2016-current	Let's Talk Science: A national, charitable organisation focused on outreach of STEM subjects to schools across Canada. Active volunteer.
Mar 2017	Centennial Public School, Waterloo: Science fair judge
Dec 2016	STC Physics Lab Day, University of Waterloo: Facilitator
Jul 2014	Millennium Mathematics Project, University of Cambridge: Volunteer at mathematical epidemiology workshop for schools.

Memberships

Deep learning in the Information Lab - University of Waterloo

Society for Industrial and Applied Mathematics

Waterloo Institute for Complexity and Innovation

Institute of Mathematics and its Applications

Programming skills

Matlab, Mathematica, Python	*strong*
C, R	*competent*

Languages

English	*mothertongue*
French	*moderate, conversational*

Other Interests

piano, tennis, running, hiking

References

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Dr Julia Gog
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